

band radiator responsive to said [stepped wave signals,] generating means for transmitting wideband, time spaced, burst signals into a selected medium; and

receiving means responsive to [signals derived from transmitted said] wideband burst signals present in said medium, as received signals, [and to times of initiation of said burst signals] for [coherently detecting] processing said [burst] received signals, [and] by, (1) coherently detecting said received signals, (2) [separately,] integrating, separately, a plurality of coherently detected signals, and [(2)] (3) integrating the resultant plurality of integrated signals and [thereby deriving an] therefrom providing intelligence signals.

Claim 20, line 2, change "broadband frequency" to --broad-frequency band--.

Add the following new claims:

Claim ~~18~~ ²⁸. A system as set forth in claim ~~15~~ ¹ wherein said receiving means includes template generating means for generating timed spaced signals as template signals and multiplier means responsive to a signal of said received signals and a template signal of said template signals for providing an output, being a product signal, and thereby coherently detecting the signal present during a said template signal.

Claim ~~19~~ ¹⁹. A system as set forth in claim ~~15~~ ¹ wherein said transmitter includes a source of potential, and switching means coupled to said source and said radiator, and responsive to said signals from said generating means, for abruptly changing the

potential on said radiator.

Claim ~~31~~³⁰. A system as set forth in claim ~~15~~¹ wherein said radiator comprises a broadband dipole antenna having a pair of triangular-shaped elements.

Claim ~~42~~³⁰. A system as set forth in claim ~~15~~¹ wherein said time spaced signals are varied in a time pattern.

Claim ~~43~~³¹. A system as set forth in claim ~~42~~³⁰ wherein said time spaced signals are a function of modulation.

Claim ~~44~~³². A system as set forth in claim ~~25~~¹ further comprising:

second and third receiving means, the three said receiving means being spaced apart; and

combining means for combining intelligence signals from said three receiving means and providing an indication of a target illuminated by said transmitter and its direction.

Claim ~~45~~³³. A system as set forth in claim ~~15~~¹ wherein said receiving means includes filter means responsive to said intelligence signals for providing a signal responsive to a selected range of frequencies.

Claim ~~46~~³⁴. A system as set forth in claim ~~15~~¹ wherein said receiving means includes a dipole antenna comprising a pair of elements, each of which, when viewed normal to the dipole length in at least one plane, appears triangular, and wherein the bases of said elements are parallel and from which elements said received signals appear.

Claim ~~47~~⁸. A system as set forth in claim ~~39~~⁷ wherein said

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template generating means generates said template signal at a time subsequent to the transmitting of a burst signal of said burst signals by said transmitting means.

Claim ~~48~~^{9c}. A system as set forth in claim ~~39~~⁷ wherein said template generating means includes means for providing a variably delayable template signal.

Claim ~~49~~¹⁰. A system as set forth in claim ~~39~~⁷ wherein:

said template generating means including for generating first and second said template signals, said second template signal being delayed with respect to said first template signal;

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said system includes first and second said multiplier means, said first multiplier means being responsive to a said received signal and said first template signal for providing one said first product signal and second multiplier means responsive to said second template signal and a said received signal for providing another said product signal;

first integrating means responsive to said first product signal for integrating said first product signal during the presence of said first template signal and providing a first integrated signal;

second integrating means responsive to said second product signal for integrating said second product signal during the presence of said second template signal and providing a second integrated signal; and

final integrating and combining means responsive to said first and second one integrated signals for combining and

integrating said first and second said integrated signals and providing intelligence signals therefrom.

Claim ~~50~~¹¹. A system as set forth in claim ~~49~~¹⁰ wherein integrating of said first and second signals precedes combining.

Claim ~~51~~¹². A system as set forth in claim ~~50~~¹ wherein said template signal is of a discrete polarity.

Claim ~~52~~¹³. A system as set forth in claim ~~51~~² wherein said receiving means includes:

timing means responsive to the time of transmitting of said burst signals for generating a set of said template signals, each said template signal of said set of said template signals being delayed by a like amount with respect to the transmitting of a burst signal of said burst signals; and

output means responsive to said timing means and a set of resulting intelligence signals for indicating the presence and distance of a target illuminated by said burst signals at a range determined by said delayed said amount.

Claim ~~53~~¹⁴. A system as set forth in claim ~~52~~¹³ wherein said receiving means includes short time integrating means for, during the presence of each said template signal of said set of template signals, individually integrating each product signal from a said set as (2) and including another integrating means for integrating the resulting set of integrated product signals as (3).

Claim ~~54~~¹⁷. A system as set forth in claim ~~53~~¹⁶ wherein said source of potential is normally applied to said radiator, and said switching means reduces the potential on said radiator.

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Claim ¹⁸~~55~~. A system as set forth in claim ~~40~~¹⁶ wherein:

said switching means comprises:

a layer of normally high-resistance, but light-responsive, low-resistance material,

a pair of electrodes coupled to said material,
and

said radiator has a pair of terminals;

said electrodes, said terminals, and said source of potential are connected in series; and

trigger means including a light source and fiber optic, and responsive to said generating means for applying a discrete increment of light from said light source through said fiber optic to said layer of said material wherein said material transitions from a high-resistance state to a low-resistance state.

Claim ¹⁹~~56~~. A system as set forth in claim ~~55~~¹⁸ wherein said material is diamond.

Claim ²¹~~57~~. A system as set forth in claim ~~41~~²⁰ wherein said transmitter includes a source of potential coupled to said dipole, and switching means responsive to said generating means for abruptly changing the potential on said dipole.

Claim ²²~~58~~. A system as set forth in claim ~~57~~²¹ wherein said transmitting means includes means for applying a switched source of potential to said elements of said dipole antenna at points generally intercepted by a line between the apices of said elements.

Claim ²³~~59~~. A system as set forth in claim ~~41~~²⁰ wherein said

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dipole antenna is planar, and said system includes a plurality of like length dipoles generally lying in a plane.

Claim ²⁴~~60~~. A system as set forth in claim ²³~~59~~ further comprising a reflector positioned in a parallel plane to that of said plurality of like length dipoles.

Claim ²⁵~~61~~. A system as set forth in claim ²⁰~~41~~ wherein said transmitter includes:

first and second electrical resistances; and

power switching means positioned adjacent to said dipole antenna and being connected to one pole of said dipole through said first said electrical resistance and connected to the other pole of said dipole through said second resistance and responsive to a signal from said generating means for abruptly changing the voltage across poles of said broadband dipole antenna through said resistances.

Claim ²⁶~~62~~. A system as set forth in claim ²⁵~~61~~ comprising:

third and fourth electrical resistances;

a source of D.C. potential having first and second terminals;

a first terminal of said source of D.C. potential being connected through said third resistance to one pole of said dipole, and said second terminal of said source of D.C. potential being connected through said fourth resistance to the other pole of said dipole; and

said power switching means includes means for switching the state of D.C. potential on said dipole to a reduced D.C.

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